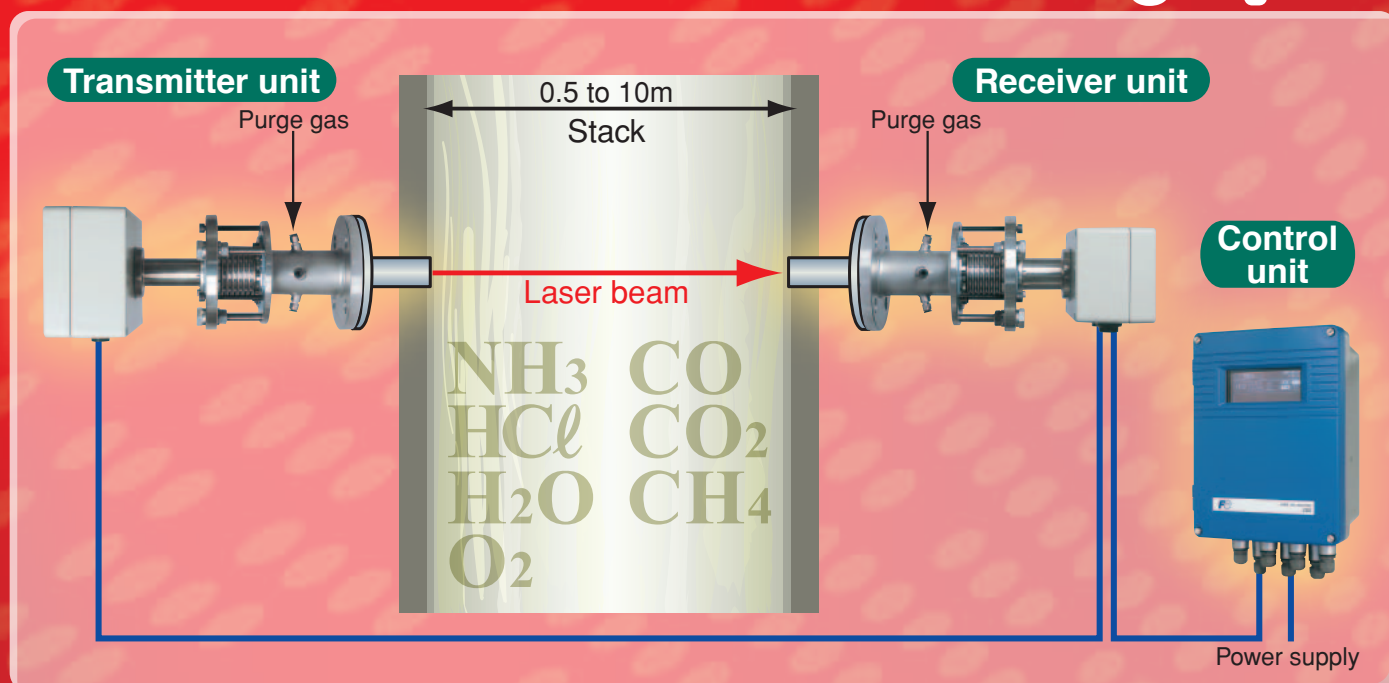


In-situ measurement

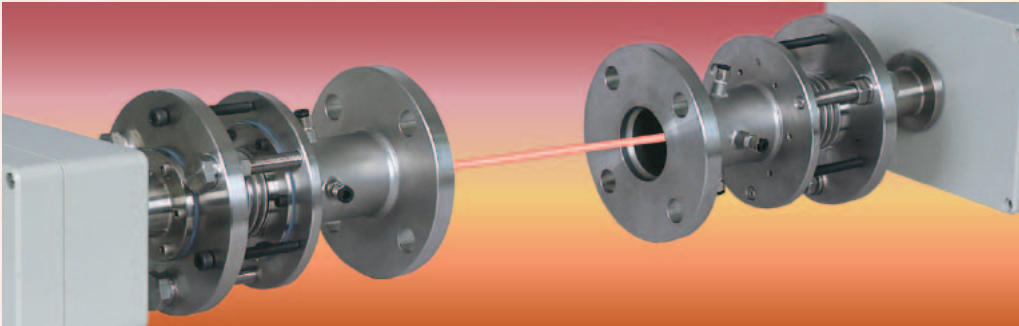
Direct insertion type **ZSS**

Measure NH_3 , HCl , H_2O , O_2 , CO , CO_2 , and CH_4 gas concentrations in a stack at high speed.



- **Excellent long-term stability: $\pm 2.0\%$ FS (zero drift)**
- **Ultra-high speed response: 1 to 5 seconds**
(High-speed response for 1 to 2 seconds is applicable)
- **Direct insertion system eliminates the need for maintenance**
- **Air purge method is adopted for O_2 meter which is no need of nitrogen gas**
- **Negligible interference by other gas components**
- **Measurement in a high-temperature/high particulate concentration environment**
- **Energy-saving 75 VA power consumption**
- **$\text{CO} + \text{O}_2$ analyzer has joined our product line**

Measures various gas components. 2-component analyzer available!



Dust
Standard:
 5 g/m³ (N) or less
High dust:
 15 g/m³ (N) or less

Table 1 Measurable Component, Measurable range

Measurable Component	Component		Min.measuring range Note 1)	Max.measuring range Note 1)	Measured gas temperature	Purge gas	4th digit	
1-component analyzer	HCℓ		10 ppm	5000 ppm	400°C or less	Air	C	
	NH ₃		15 ppm	5000 ppm	450°C or less		W	
	CO		2.0 vol%	50 vol%	300°C or less		A	
	CO (High temperature)		10 vol%	50 vol%	1200°C or less		B	
	CO ₂		2.0 vol%	50 vol%	300°C or less		G	
	CO ₂ (High temperature)		10 vol%	50 vol%	1200°C or less		H	
	CH ₄		100 ppm	50 vol%	300°C or less	N ₂	R	
	O ₂		4 vol%	100 vol%	300°C or less		P	
	O ₂ (High temperature)		4 vol%	50 vol%	1200°C or less		Q	
	O ₂ (Air purge)		25 vol%	100 vol%	400 to 1200°C	Air	T	
2-component analyzer	HCℓ + H ₂ O (50 vol%) Note 2)		50 ppm (HCℓ)	1000 ppm (HCℓ)	130 to 400°C	Air	F	
	NH ₃ + H ₂ O (50 vol%) Note 2)		50 ppm (NH ₃)	1000 ppm (NH ₃)	130 to 450°C		X	
	CO+CO ₂		2.5 vol%	50 vol%	300°C or less		K	
	CO+CO ₂ (High temperature)		10 vol%	50 vol%	1200°C or less		L	
2-laser 2-component analyzer	CO+O ₂ (Air purge)		CO	200 ppm	400 to 1200°C	Air	V	
			O ₂	25 vol%				100 vol%
	CO+O ₂ (High temperature)		CO	200 ppm	1200°C or less	N ₂	U	
			O ₂	5 vol%				50 vol%
	CO+O ₂		CO	4 vol%	50 vol%		300°C or less	S
			O ₂	10 vol%				

Note 1) Min. and Max. measuring range in the above table are for measuring path length (stack length) of 1m. See below on the ranges for other path lengths.

Note 2) Consult us when selecting H₂O analyzer.

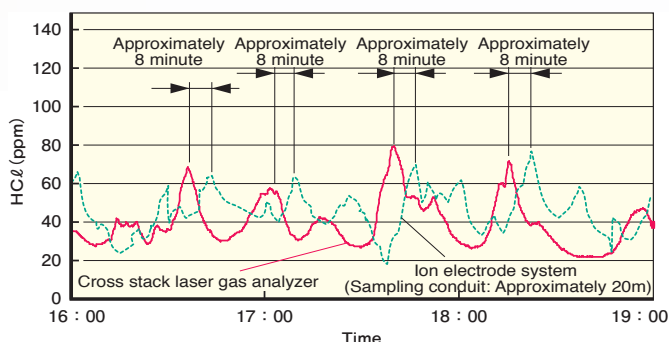
● Calculation method of measuring range for optical path length other than 1m

Measuring range = [Min. or Max. range ÷ path length in Table 1]

Ex. 1) HCℓ analyzer, path length 5m
 Max. range: 5,000ppm ÷ 5m = 1,000ppm
 Min. range: 10ppm ÷ 5m = 2ppm
 Therefore, measuring range is between 0 to 2 ... 1,000ppm

Ex. 2) HCℓ analyzer, path length 0.5m
 Max. range: 5,000ppm ÷ 0.5m = 10,000ppm
 Min. range: 10ppm ÷ 0.5m = 20ppm
 Therefore, measuring range is between 0 to 20 ... 10,000ppm

■ An ultra-high speed measurement (within 2 seconds): 8minutes faster than gas sampling method



■ Energy efficient, low running cost

Low-power consumption (75VA maximum). Low maintenance (at most 2 times/year) reduces running cost.

■ Easy maintenance

No need of gas sampling, pretreatment, or parts replacement such as filters and catalysts.

■ Barely affected by the interference of other gas components

Minimal interference from other gasses thanks to the use of an infrared semiconductor laser, which matches the absorption wavelength of the measuring components.

■ Excellent long-term stability

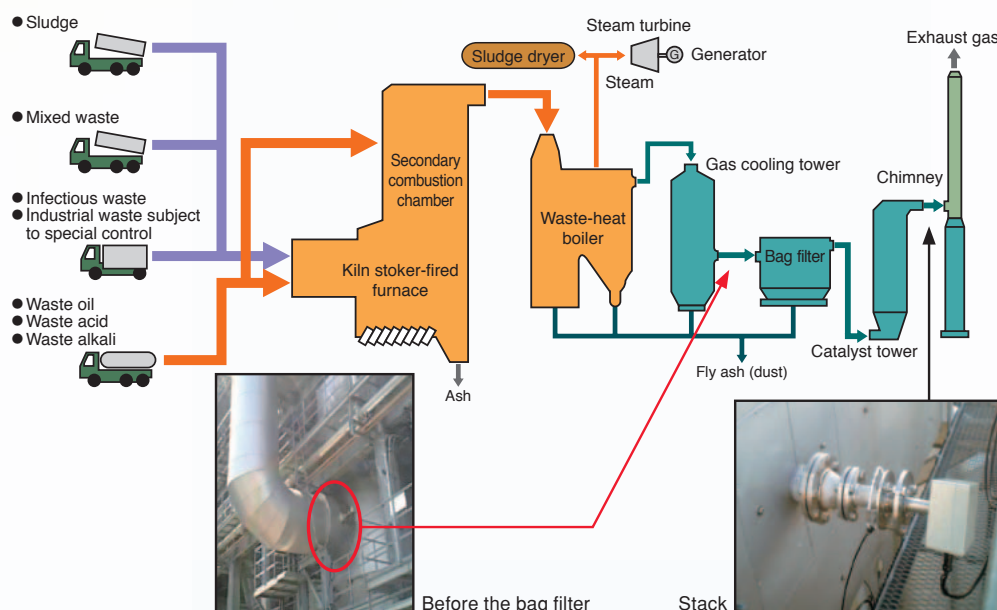
±2.0%FS (zero drift)

Ideal for HCl and NH_3 , CO , CO_2 , CH_4 , O_2 gas concentration measurements

Application example 1 Industrial waste treatment plant

An ultra-high speed response (2 seconds or less) allows optimum control of the calcium hydroxide injection volume.

- 1 Measurement of the hydrogen chloride (HCl) gas concentration before the bag filter and in the stack.
- 2 Continuous monitoring of the discharged hydrogen chloride (HCl) and oxygen (O_2) gas concentrations.
- 3 Optimum combustion control by measuring $\text{CO} + \text{O}_2$ at the furnace outlet.



Direct measurement of process gas component

HCl , NH_3 , CO , CO_2 , CH_4

Measurement of O_2 concentration in flammable gases

Safety monitoring of plant

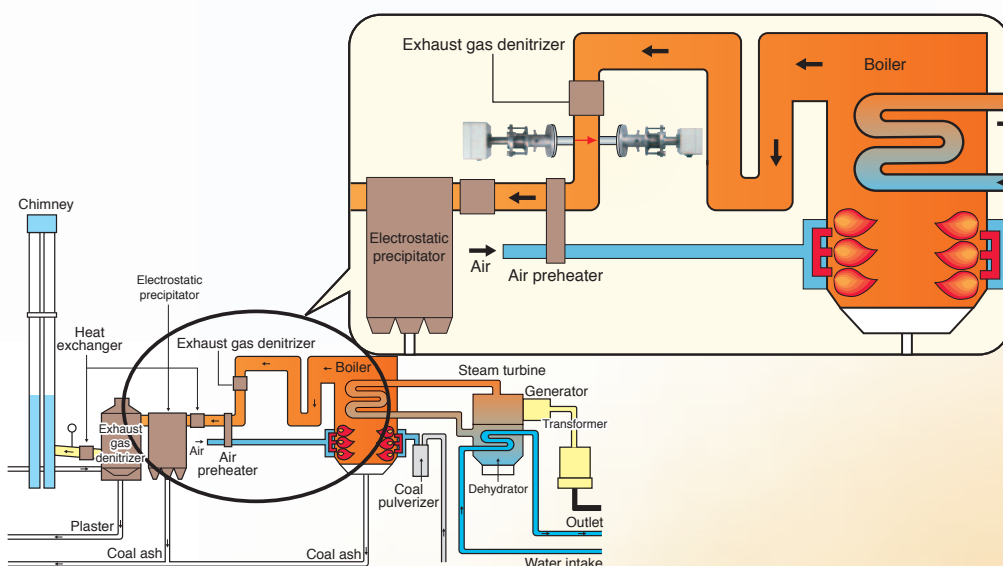
Measurement of O_2 and CO in furnace

Combustion process control

Application example 2 Large type boiler

High-speed response (2 seconds or less) allows optimum control of the ammonia (NH_3) injection volume.

- 1 Ammonia (NH_3) gas concentration measurement after denitration.
- 2 Optimum combustion control by measuring $\text{CO} + \text{O}_2$ at the furnace outlet.



NH_3 measurement in denitration equipment

Environmental monitoring by measuring NH_3 leak

Improved recovery of converter furnace gas

Increasing gas recovery by high-speed response of O_2 and CO

Safety management by CO measurement

Safety management of plant and silo

Code Symbols

ZSS

4	5	6	7	8
				6

 -

9	10	11	12	13

 -

14	15	16	17	18	19	20
			0			

 -

21	22
N	

Digit	Specification	Note	Code
4	Measurable components		A
	CO (High temperature)		B
	HC ℓ		C
	HC ℓ + H ₂ O (50 vol%)	Note 1	F
	CO ₂		G
	CO ₂ (High temperature)		H
	CO+CO ₂	Note 2	K
	CO+CO ₂ (High temperature)	Note 2	L
	O ₂		P
	O ₂ (High temperature)		Q
	O ₂ (Air purge)		T
	ppm CO + O ₂ (Air purge)		V
	ppm CO + O ₂ (High temperature)		U
	vol% CO + O ₂		S
	CH ₄		R
	NH ₃		W
	NH ₃ +H ₂ O (50 vol%)	Note 1	X
5	Unit		1
	mg/m ³		3
	vol%		5
	ppm (1st comp), vol% (2nd comp)		7
	vol% (1st comp), vol% (2nd comp)		9
6	Measuring range (1st components)	Note 3, 4	K
	0 to 2		Q
	0 to 2.5		S
	0 to 4		L
	0 to 5		V
	0 to 10		0
	0 to 15		1
	0 to 20		T
	0 to 25		A
	0 to 50		B
	0 to 100		C
	0 to 200		D
	0 to 250		J
	0 to 400		E
	0 to 500		F
	0 to 1000		G
	0 to 2000		H
	0 to 5000		M
	0 to 6000		X
	Others		X
7	Measuring range (2nd components)	Note 3, 4	K
	0 to 2		Q
	0 to 2.5		S
	0 to 4		L
	0 to 5		V
	0 to 10		0
	0 to 15		1
	0 to 20		T
	0 to 25		A
	0 to 50		B
	0 to 100		C
	0 to 200		D
	0 to 250		J
	0 to 400		E
	0 to 500		F
	0 to 1000		G
	0 to 2000		H
	0 to 5000		M
	Others		X
	None		Y
9	Flange rating		A
	10K 50A (JIS B 2212)		B
	10K 100A		C
	DN50/PN10		D
	ANSI #150 2B		
10	Number of analog output points		0
	4 points		1
11	Number of analog input points		A
	6 points (Unselectable for CO + O ₂)		B

Digit	Specification	Note	Code
12	Analog output		1
	4 to 20mA DC		2
	0 to 20mA DC		3
	0 to 1V DC		4
	0 to 5V DC		5
13	Contact output/ input		0
	5 output points, No input		1
14	Cable length between receiver and control unit		A
	5m		B
	10m		C
	20m		D
	30m		E
	40m		F
	50m		G
	80m		H
	100m		X
	Others		X
15	Cable length between receiver and transmitter		A
	2m		B
	5m		C
	10m		D
	15m		E
	20m		F
	25m		X
16	Display and operation manual		J
	Japanese		E
	English		C
	Chinese		C
17	—		0
18	Measuring optical path length (unit: 1m)		0
	0m		1
	1m		2
	2m		3
	3m		4
	4m		5
	5m		6
	6m		7
	7m		8
	8m		9
19	Measuring optical path length (unit: 0.1m)		0
	0.0m		1
	0.1m		2
	0.2m		3
	0.3m		4
	0.4m		5
	0.5m		6
	0.6m		7
	0.7m		8
20	Measuring optical path length (unit: 0.01m)		0
	0.00m		5
	0.05m		9
	(Used only when 10m is specified)		
21	—		N
22	High-dust, High-speed, AGC		N
	None Provided	Note 5	H

Note 1) Consult us when selecting H₂O measurement.

Note 2) Specify the same range for CO and CO₂. If different range is desired for CO and CO₂, specify the "X" at 6 digit and give a description of each range.

Note 3) When using CO + O₂ measurement, select a "CO measuring range" in the 6th digit, and a "O₂ measuring range" in the 7th digit.

Note 4) Specify the range within the max./min. range calculated from optical path length.

Note 5) Select "H" for O₂ analyzer for high dust, high-speed, and combustion control.

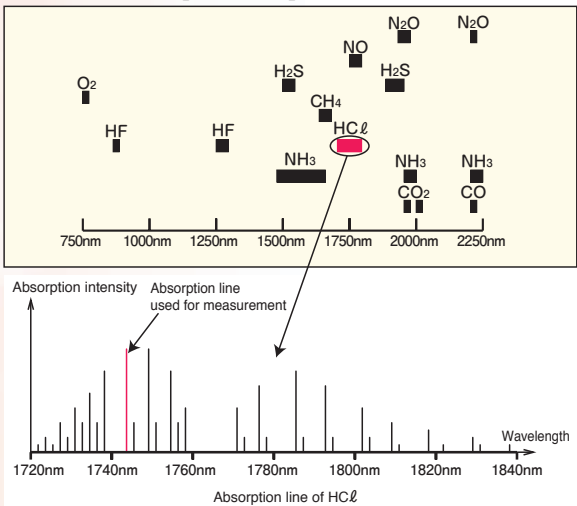
Measurement principle

This instrument uses an infrared semiconductor laser as its light source, and a photodiode for its receiver unit.

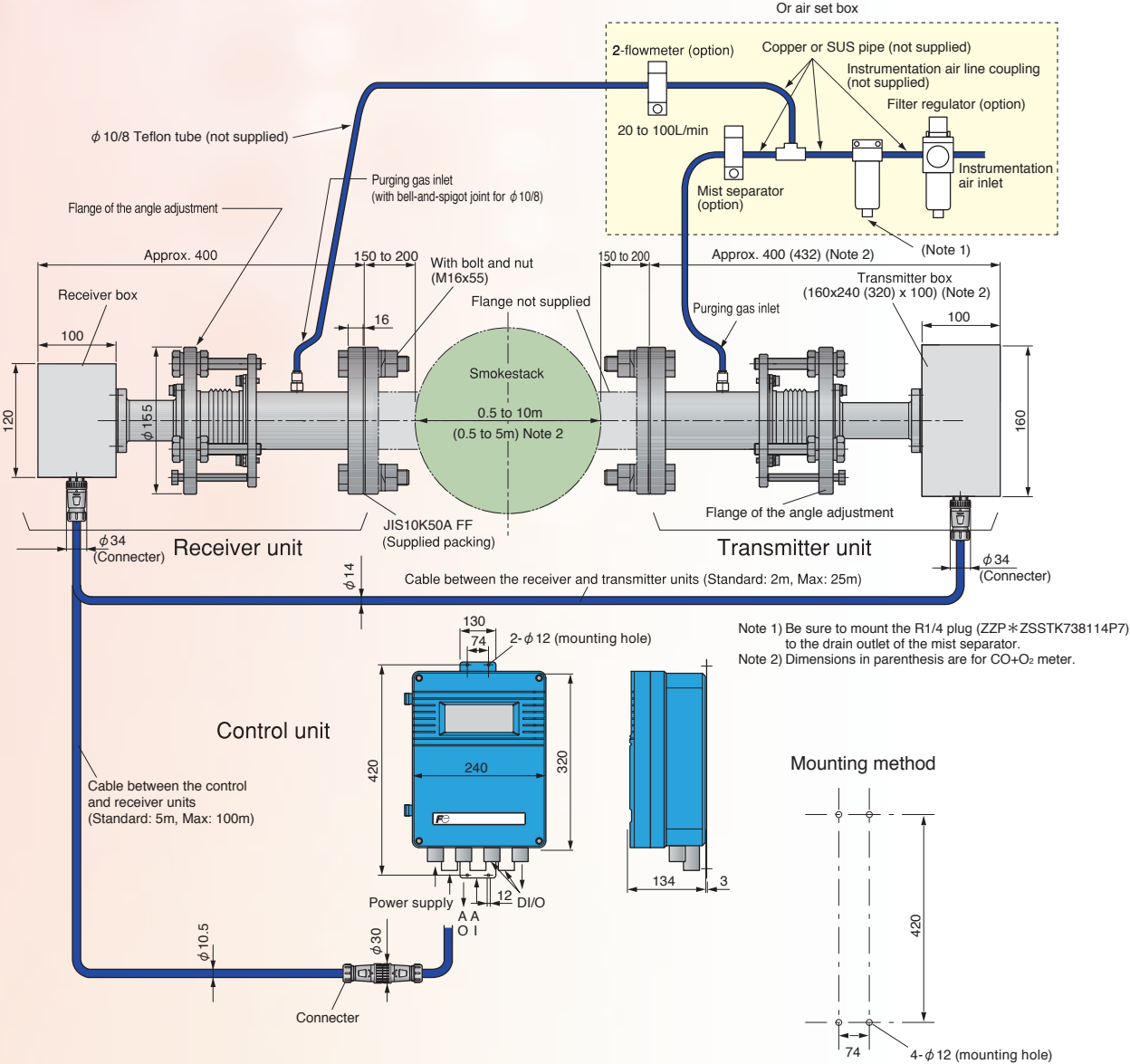
The gas components to be measured have a waveband for absorbing light unique to each of them (see the following diagram). This waveband represents the collection of a number of absorption lines; one of which is used for measurement.

Since measurement is performed within this extremely narrow waveband, it is unaffected by the interference of other gases in principle. Modulated signal amplitude, rather than a change of the optical volume, is used to detect the concentration.

Gas absorption spectrum



Outline Diagram (Unit: mm)



Specifications

● General

Measurement principle	Non-dispersive infrared absorbance system (NDIR)
Measurement method	Cross-stack system
Measurable components	See the table 1
Measurable range	
Light source	Near-infrared semiconductor laser
Laser class	CLASS 1 (O ₂ analyzer for high temperature and O ₂ analyzer for air purge are CLASS 3B)
Power supply voltage	100 V to 240 V AC, 50/60 Hz
Power consumption	Approximately 75 VA (CO + O ₂ : 80 VA)
Calibration interval	Once every six months (Maintenance cycle may vary depending on the operating environment.)
Display	LCD with back light (control unit)
Display contents	Measurable component, measurement concentration (instantaneous value, O ₂ correction instantaneous value, average value, and O ₂ correction average value), alarm (fault status)
Weight	Receiver unit, transmitter unit: Approx. 10kg each Control unit: Approximately 8kg
External dimensions	See the dimension diagram.
Construction	Waterproof (IP65)
Applied standard	CE mark

● Performance

Response time	1 to 5 seconds or less (High-speed response type: 1 to 2 seconds)
Repeatability	±1.0% FS (depending on measuring component and measuring range) *CO + O ₂ : ±2% FS
Linearity	±1.0% FS (depending on measuring component and measuring range) *CO + O ₂ : ±3% FS
Zero drift	±2.0% FS (depending on measuring component and measuring range) *CO + O ₂ : ±4% FS/6 months
Interference from other gases	±2.0% FS
Minimum detectable limit	1% of the minimum range

● Scope of Delivery

- Receiver box
- Transmitter box
- Control unit
- Angle adjustment mechanical section (required 2 units, one for receiver and the other for transmitter)
- Cable between receiver unit and transmitter unit (specified length)
- Cable between receiver unit and control unit (specified length)
- Hexagon socket head cap screw (Connecting bolt between angle adjustment mechanical section and receiver box)
- Standard accessory set

● Optional Items

- Spare parts for one year (ZBN1SS12)
 - Calibration gas cell (*1) (*2)
 - Cable between receiver unit and transmitter unit (For calibration) (*1)
 - Cable between receiver unit and control unit (For calibration) (*1)
 - Standard gas (ZBM), pressure regulator (ZBD)
 - Recorder (when necessary, Fuji's product type PHL/PHF, etc.)
 - Others
- *1: One set of the cables and calibration gas cell are necessary for installation and annual maintenance.
- *2: Standard length 1m (200mm or 500mm when the measuring range is low concentration)

● Input / Out put signal

Analog output	4 to 20 mA DC or 0 to 1 V DC, 2 or 4 points (0 to 5V, 1 to 5V or 0 to 10V DC is available.) (Measurement value, O ₂ correction value, Average value and instantaneous value are switchable by settings.)
Analog input	4 to 20 mA DC, 2 or 6 points (CO + O ₂ : not available) (Measured gas pressure, measured gas temperature, measured gas velocity, O ₂ gas concentration, water concentration, purge pressure) *Measurement concentration correction, O ₂ conversion or alarm output is performed according to the input signal.
Contact output	Relay contact output 5 points Insufficient amount of light received, outside the range of the upper/lower limits, device failure, during calibration or on hold, power turned off
Contact input (option)	Photo coupler contact input: 3 points Average value reset signal, switching instantaneous value/moving average value and remote hold

● Installation environment

Ambient temperature	-20 to +55°C (Receiver unit, transmitter unit) -5 to +45°C (Control unit)
Ambient humidity	90% RH or less
Measurable optical path length	0.5 to 10m (CO + O ₂ : 0.5 to 5 m)
Mounting flange dimension	JIS 10K, 50 A or 100 A, Others
Purge gas	See the table 1 (Pressure: 0.3 MPa or more)
Purge gas flow rate	20L/min or more
Measured gas condition	Temperature: see the table 1 Pressure: ±10kPa (O ₂ for air purge is -10 kPa to 100 kPa) Moisture: 50vol% or lower (condensation unallowable) Dust Standard: 5 g/m ³ (N) or less High dust: 15 g/m ³ (N) or less

Conforms to JIS B7993 "Automatic exhaust gas component measurement system by analyzer adopting a non-absorption sampling method."

● Standard accessories

Name	Quantity	SPECIFICATIONS
Bolt	8 (16)	M16×5 (70) SUS (※)
Nut	8 (16)	M16 SUS (※)
Spring washer	8 (16)	M16 SUS (※)
Flat washer	8 (16)	M16 SUS (※)
Companion flange packing	2	See flange rating.
Bolt for angle regulation	6	Hexagonal socket bolt M8×70
Power fuse	2	
Connecting bolt between receiving unit and transmitter unit	12	Hex socket bolt M5×12
Instruction manual	1	

(*When "B" or "C" is specified in the 9th digit in a code symbol, quantity is 16 pieces. 8 pieces are attached in other cases.)
(*When "B", "C" or "D" is specified in the 9th digit, Bolt length is 70mm. It is 55mm in other cases. Inch-sized bolts are not applicable.)

● Spare parts for one year (Type: ZBN1SS12)

Name	Quantity	SPECIFICATIONS
Silicon packing A	2 pieces	For bellows (*ZSSTK7N3508P1)
O-ring	2 pieces	(ZZP*ZSSTK7P2530P5)

⚠ Caution on Safety

* Before using products in this catalog, be sure to read their instruction manuals in advance.

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